Amendments to the Claims

The listing of claims will replace all prior versions, and listings of claims in the application.

Claim1. (Currently amended) A cable modem termination system for a cable plant comprising:

a burst receiver for processing data signals having physical layer parameters that control the manner in which the data signals are transmitted on an upstream channel of the cable plant;

a transmitter for sending messages on a downstream channel of the cable plant to cable modems; and

a monitoring circuit for collecting packet based statistics representative of the ~~transmission~~ channel quality of the upstream channel, the monitoring circuit sending a message to the transmitter for the cable modems to change a physical layer parameter responsive to the collected statistics and to the burst receiver to process data signals based on the changed physical layer parameter, wherein channel quality is an ability of a channel to transmit data reliably thereon, such that a higher quality channel transmits data reliably at a higher data rate than a lower quality channel.

Claim 2. (Original) The cable modem termination system of claim 1, in which the monitoring circuit collects statistics about the number of packets and the number of undetected packets.

Claim 3. (Original) The cable modem termination system of claim 1, in which the monitoring circuit collects statistics about the number of packets and the number of packets without a unique word.

Claim 4. (Original) The cable modem termination system of claim 1, in which the monitoring circuit collects statistics about the number of packets and the number of packets with corrected errors.

Claim 5. (Original) The cable modem termination system of claim 1, in which the monitoring circuit collects statistics about the number of packets and the number of packets with uncorrectable errors.

Claim 6. (Previously Presented) The cable modem termination system of claim 1, in which the monitoring circuit collects statistics about the number of forward error correction (FEC) blocks and the number of FEC blocks with corrected errors.

Claim 7. (Previously Presented) The cable modem termination system of claim 1, in which the monitoring circuit collects statistics about the number of forward error correction (FEC) blocks and the number of FEC blocks with uncorrectable errors.

Claim 8. (Original) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the type of modulation.

Claim 9. (Original) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the coding gain.

Claim 10. (Original) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the symbol rate.

Claim 11. (Original) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the guard time.

Claim 12. (Original) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the constellation size of the modulation.

Claim 13. (Original) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the physical layer parameters in real time.

Claim 14. (Original) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the frequency of the carrier.

Claim 15. (Previously Presented) The cable modem termination system of claim 1, 2, 3, 4, 5, 6, or 7, in which the monitoring circuit sends a message to change the frequency of the carrier in a non-uniform manner.

Claim 16. (Currently amended) A headend terminal for a bidirectional ~~assymetric~~ asymmetric, transmission system having a downstream channel that broadcasts data from the headend terminal to a plurality of subscriber terminals and an upstream channel that unicasts data from the individual subscriber terminals to the headend terminal, the headend terminal comprising:

a burst receiver for processing data signals having physical layer parameters that control the manner in which the data signals are transmitted on the upstream channel;

a transmitter for sending messages on the downstream channel; and

a monitoring circuit for collecting statistics about the data signals transmitted on the upstream channel, the statistics representative of the ~~transmission~~ channel quality of the upstream channel, the monitoring circuit sending a message to the transmitter for the cable modems to change a physical layer parameter responsive to the collected statistics and to the burst receiver to process data signals based on the changed physical layer parameter, wherein channel quality is an ability of a channel to transmit data reliably thereon, such that a higher quality channel transmits data reliably at a higher data rate than a lower quality channel.

Claim 17. (Currently amended) A method for transmitting data over a cable system in an upstream direction to a headend from a plurality of subscriber stations located at different distances from the headend such that the transmission paths to the headend are different, the method comprising the steps of:

establishing an upstream channel from the subscriber stations to the headend;

monitoring at the headend the ~~transmission~~ channel quality of the upstream channel;

establishing a downstream channel from the headend to the subscriber stations;

transmitting to the subscriber stations over the downstream channel a command to change the mode of transmission to the headend over the upstream channel if the monitored ~~transmission~~ channel quality fails to meet a prescribed threshold level;

receiving the command at the subscriber stations; and

transmitting data over the upstream channel from the subscriber stations to the headend in accordance with the changed mode of transmission after receipt of the command, wherein channel quality is an ability of a channel to transmit data reliably thereon, such that a higher quality channel transmits data reliably at a higher data rate than a lower quality channel.

Claim 18. (Original) The method of claim 17, in which the monitoring step monitors the noise power on the upstream channel.

Claim 19. (Original) The method of claim 17, in which the monitoring step monitors the signal-to-noise ratio of a signal received on the upstream channel.

Claim 20. (Original) The method of claim 17, in which the monitoring step monitors the channel statistics of the upstream channel.

Claim 21. (Original) The method of claim 20, in which the monitored statistics comprise the number of undetected packets.

Claim 22. (Original) The method of claim 20, in which the monitored statistics comprise the number of packets with corrected errors.

Claim 23. (Original) The method of claim 20, in which the monitored statistics comprise the number of packets with uncorrected errors.

Claim 24. (Previously Presented) The method of claim 20, in which the monitored statistics comprise the number of forward error correction (FEC) blocks with corrected errors.

Claim 25. (Previously Presented) The method of claim 20, in which the monitored statistics comprise the number of forward error correction (FEC) blocks with uncorrected errors.

Claim 26. (Previously Presented) The method of claim 20, in which the monitored statistics comprise a combination of two or more of the following: the number of undetected packets, the number of packets with corrected errors, the number of packets with uncorrected errors, the number of forward error correction (FEC) blocks with corrected errors, and the number of FEC blocks with uncorrected errors.

Claim 27. (Currently Amended) The method of claim 17, in which the command transmitting step comprises transmitting a command to change the type of modulation from a first type that can reliably transmit at a high bit rate over a high

quality channel to a second type that can reliably transmit at a lower bit rate over a lower quality channel if the monitored ~~transmission~~ channel quality at the first type of modulation fails to meet the prescribed threshold level.

Claim 28. (Previously Presented) The method of claim 27, in which the first type of modulation is quadrature amplitude modulation (QAM) and the second type of modulation is quadrature phase shift keying (QPSK).

Claim 29. (Original) The method of claim 27, in which the data transmitting step transmits data to the headend in accordance with the second type of modulation after the command.

Claim 30. (Currently amended) The method of claim 29, in which the command transmitting step additionally comprises transmitting a command to change the position of the channel in the spectrum if the monitored ~~transmission~~ channel quality at the second type of modulation fails to meet the prescribed threshold level.

Claim 31. (Original) The method of claim 30, in which the command transmitting step additionally comprises transmitting a command to change one or more physical layer parameters.

Claim 32. (Original) The method of claim 17, in which the step of establishing an upstream channel establishes a channel that has a narrow bandwidth and the step of establishing a downstream channel establishes a channel that has a broad bandwidth.

Claim 33. (Original) The method of claim 17, additionally comprising the step of adjusting a notch filter at the headend to establish coefficients that reject one or more bands of common noise.

Claim 34. (Previously Presented) The method of claim 33, in which the monitoring step comprises Fast Fourier Transform (FFT) processing of the filter coefficients to determine the inverse of the channel spectrum.

Claim 35. (Original) The method of claim 34, in which the command transmitting step transmits a command to change the position of the channel in the spectrum to avoid ingress noise.

Claim 36. (Currently amended) A cable modem termination system having an upstream channel shared among a plurality of cable modems and a burst receiver connected to the upstream channel to process physical layer signals transmitted on the upstream channel, a monitoring circuit for collecting packet based statistics representative of the ~~transmission~~ channel quality of the upstream channel, the monitoring circuit comprising an input for receiving the physical layer signals from the burst receiver, means for sensing parameters that control the manner of transmission of the physical layer signals, and a plurality of counters for collecting the sensed physical layer parameters, wherein channel quality is an ability of a channel to transmit data reliably thereon, such that a higher quality channel transmits data reliably at a higher data rate than a lower quality channel.

37. (Original) The cable modem termination system of claim 36, in which the monitoring circuit collects statistics about the number of packets and the number of undetected packets.

38. (Original) The cable modem termination system of claim 36 or 37, in which the monitoring circuit collects statistics about the number of packets and the number of packets without a unique word.

39. (Original) The cable modem termination system of claim 36 or 37, in which the monitoring circuit collects statistics about the number of packets and the number of packets with corrected errors.

40. (Original) The cable modem termination system of claim 36 or 37, in which the monitoring circuit collects statistics about the number of packets and the number of packets with uncorrectable errors.

41. (Previously Presented) The cable modem termination system of claim 36 or 37, in which the monitoring circuit collects statistics about the number of forward error correction (FEC) blocks and the number of FEC blocks with corrected errors.

42. (Previously Presented) The cable modem termination system of claim 36 or 37, in which the monitoring circuit collects statistics about the number of forward error correction (FEC) blocks and the number of FEC blocks with uncorrectable errors.